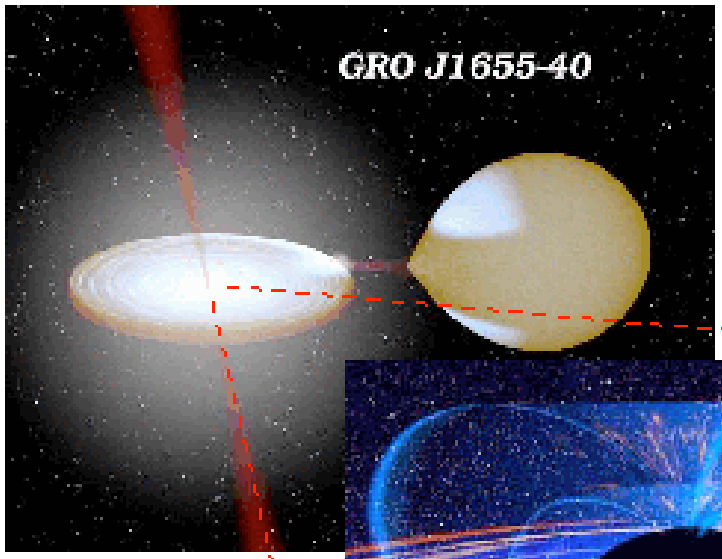
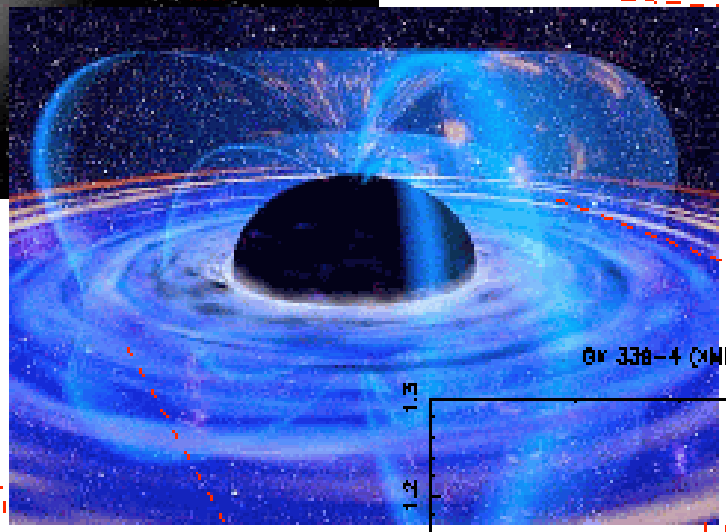
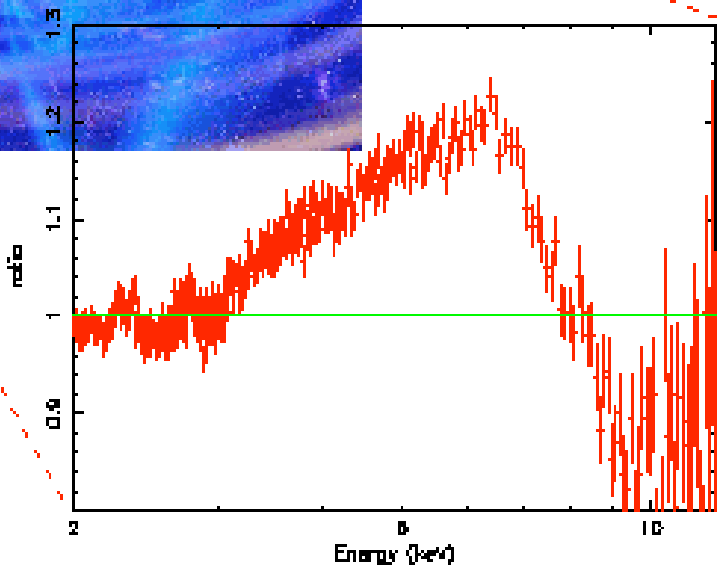
Revealing Relativity:
Galactic Black Holes in the Con-X Era







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(on behalf of a larger group)

Old Con-X Objectives for X-ray Binaries

- "Use X-ray radial velocity measurements to determine the mass function of black holes, neutron stars, and white dwarfs in binary systems."

_ *For the vast majority of systems, this will be done with narrow Bowen fluorscence lines from the companion.*

- "Measure the gravitational redshift at the surface of white dwarfs in magnetic CVs using the Fe K fluorescence lines."

_ *Resolution of ~3000 is needed.*

New Objectives for Galactic Black Holes

- Search for black hole spin, range of spin parameters via skewed Fe K lines. Search for other skewed lines.
- Probe the corona-disk interaction: quasi-spherical corona, pancake, or magnetic flaring loops?
- Determine the nature of low-luminosity flows: ADAF, jet, or ADAF+jet, and where is the disk?

Relativistic Fe K Lines

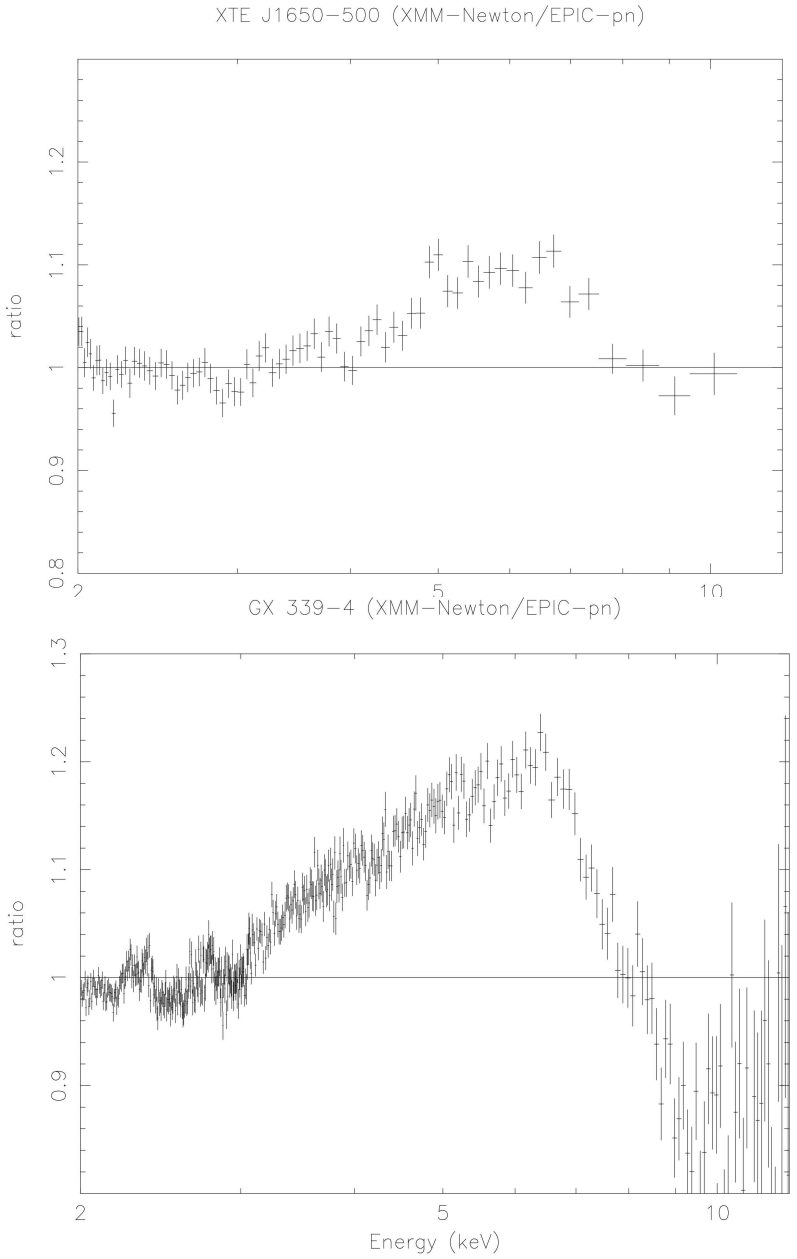
- Rule-out 6 R_grav.
  _ R = 1.24 R_grav.

- Rule-out q = 3 , $J(r) = r^{(-q)}$
  _q = 5.5-6

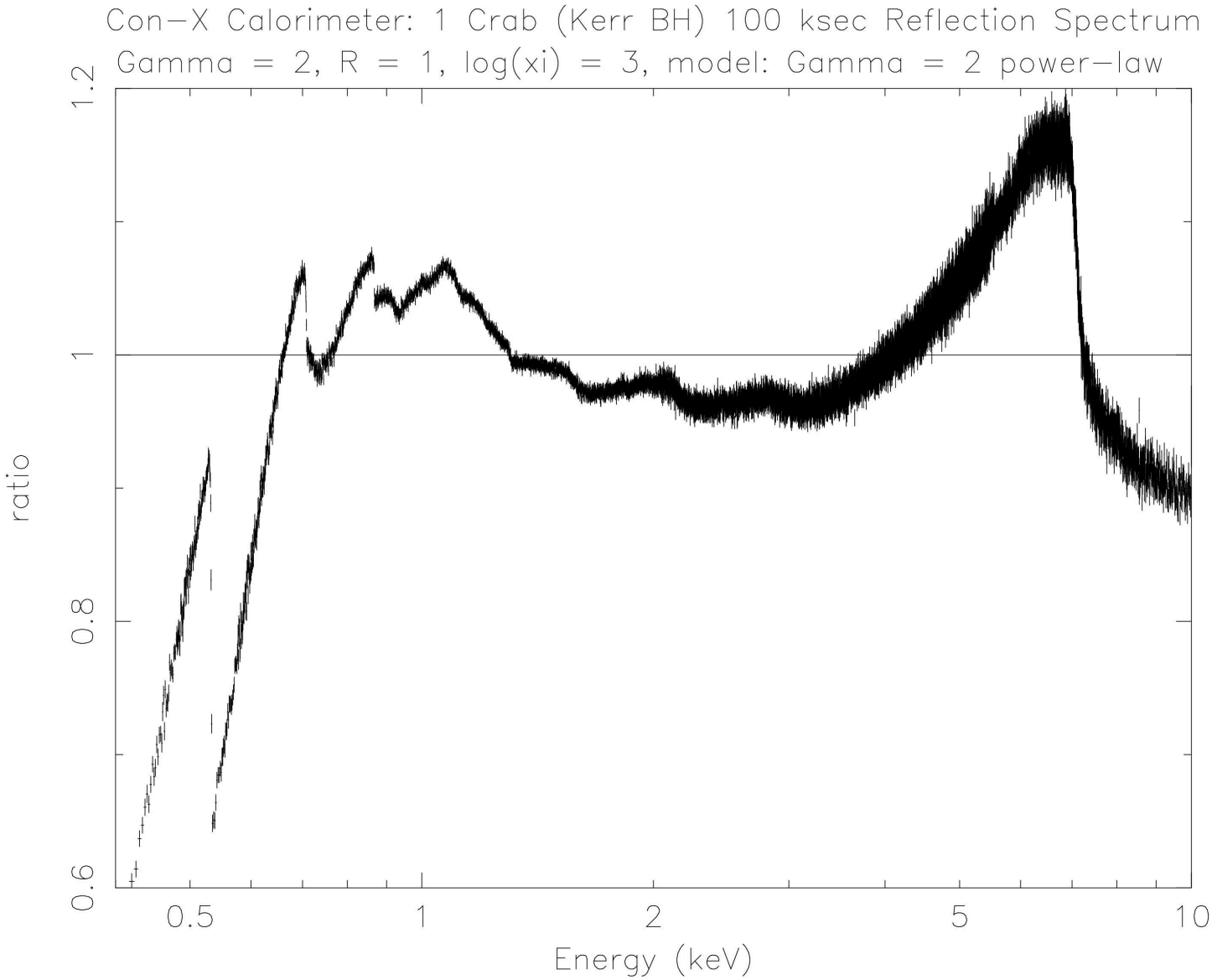
- Simultaneous [Chandra/XMM-N] and RXTE for continuum.

_ Lines are largely independent of the continuum model chosen.

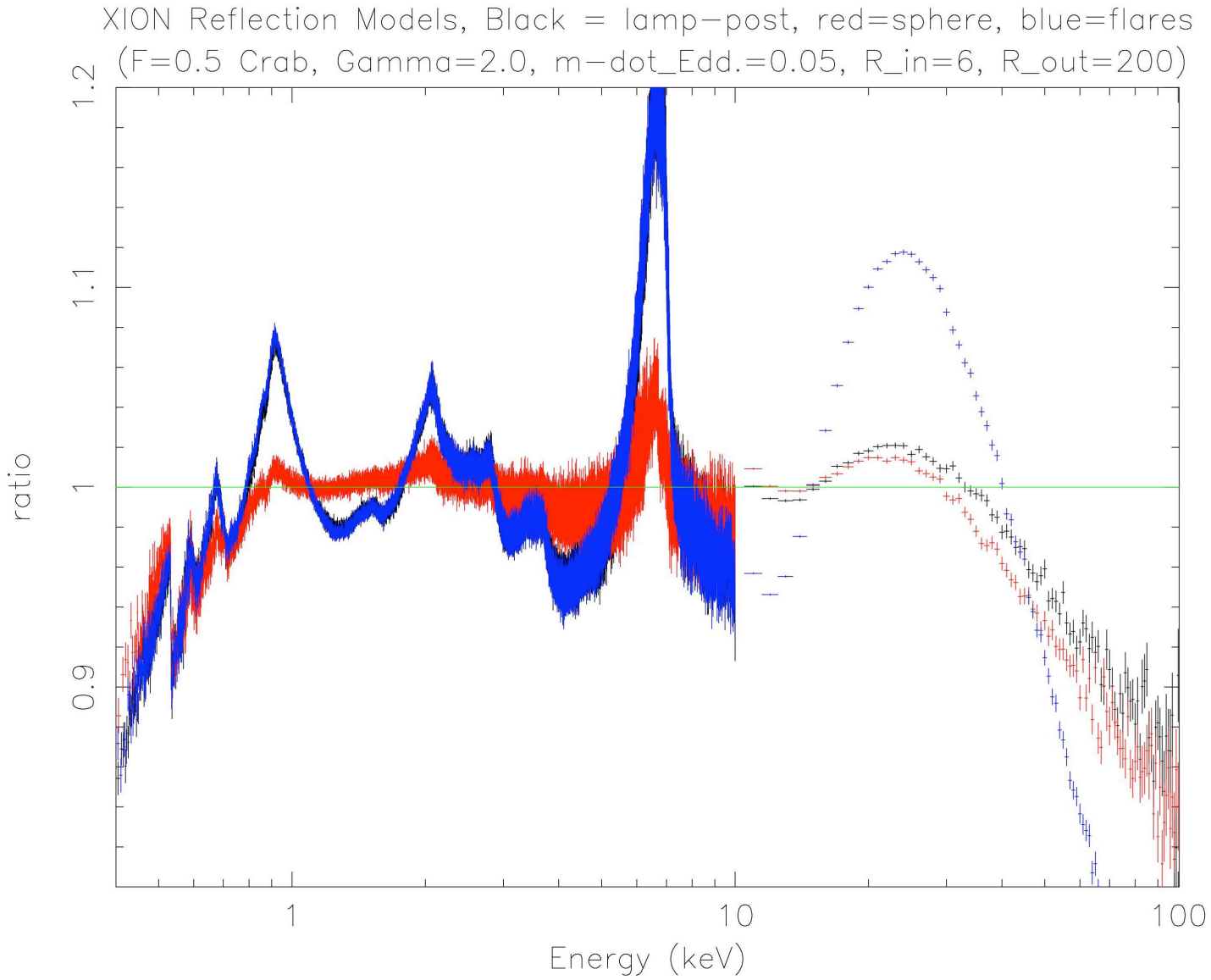
We need to be able to handle ~1 Crab sources.



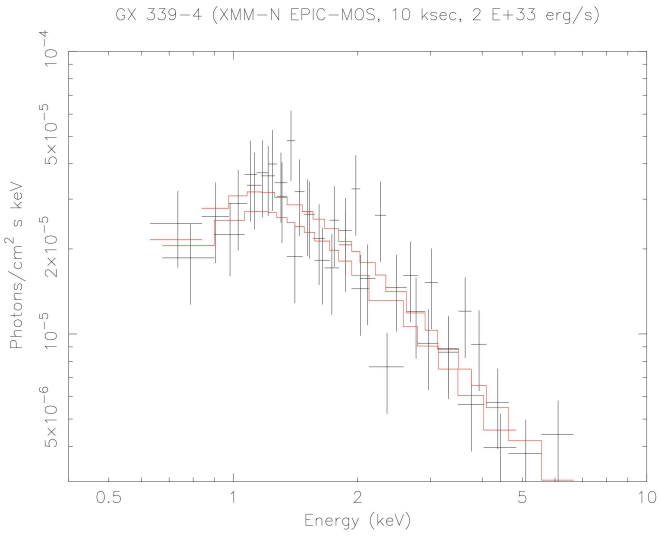
Multiple Relativistic Lines

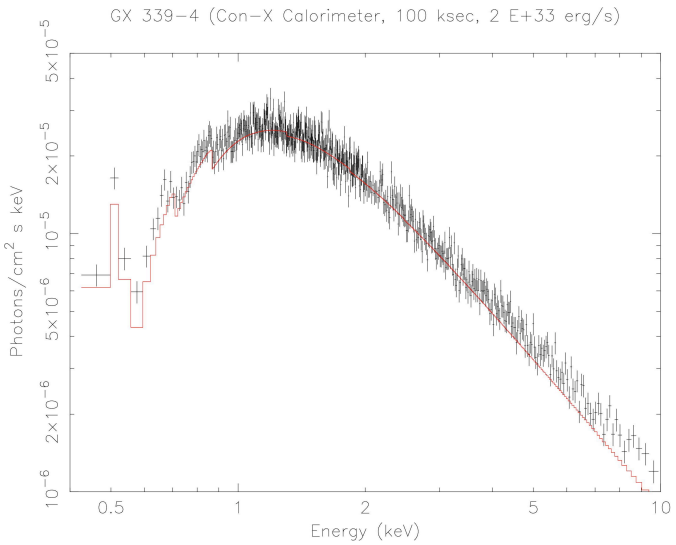


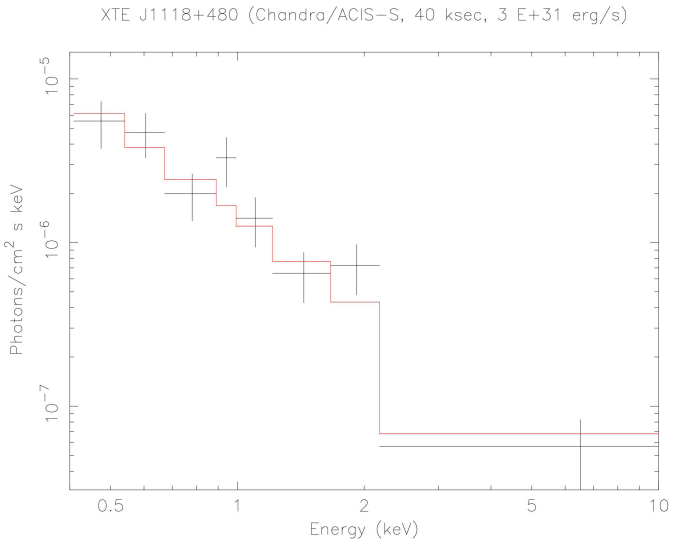
The Disk-Corona Interaction

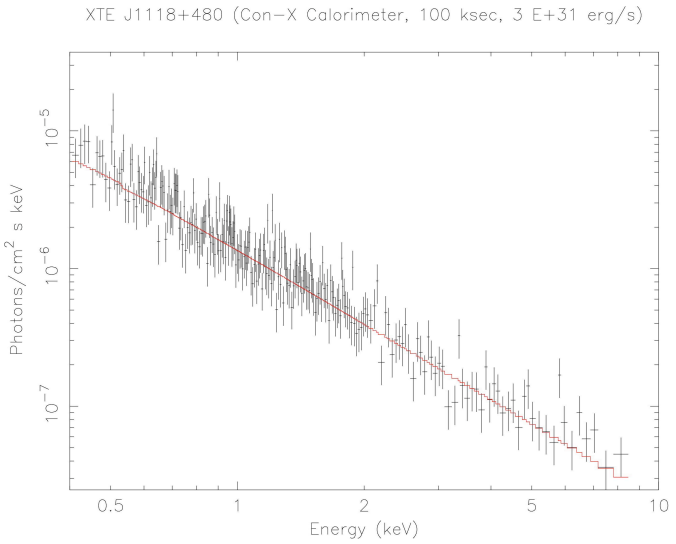


Galactic Black Holes in Quiescence









Con-X Will be Revolutionary for GBHs

- Spin may be revealed with multiple relativistic lines.
- Even more exotic physics may be probed (B-Z effect).

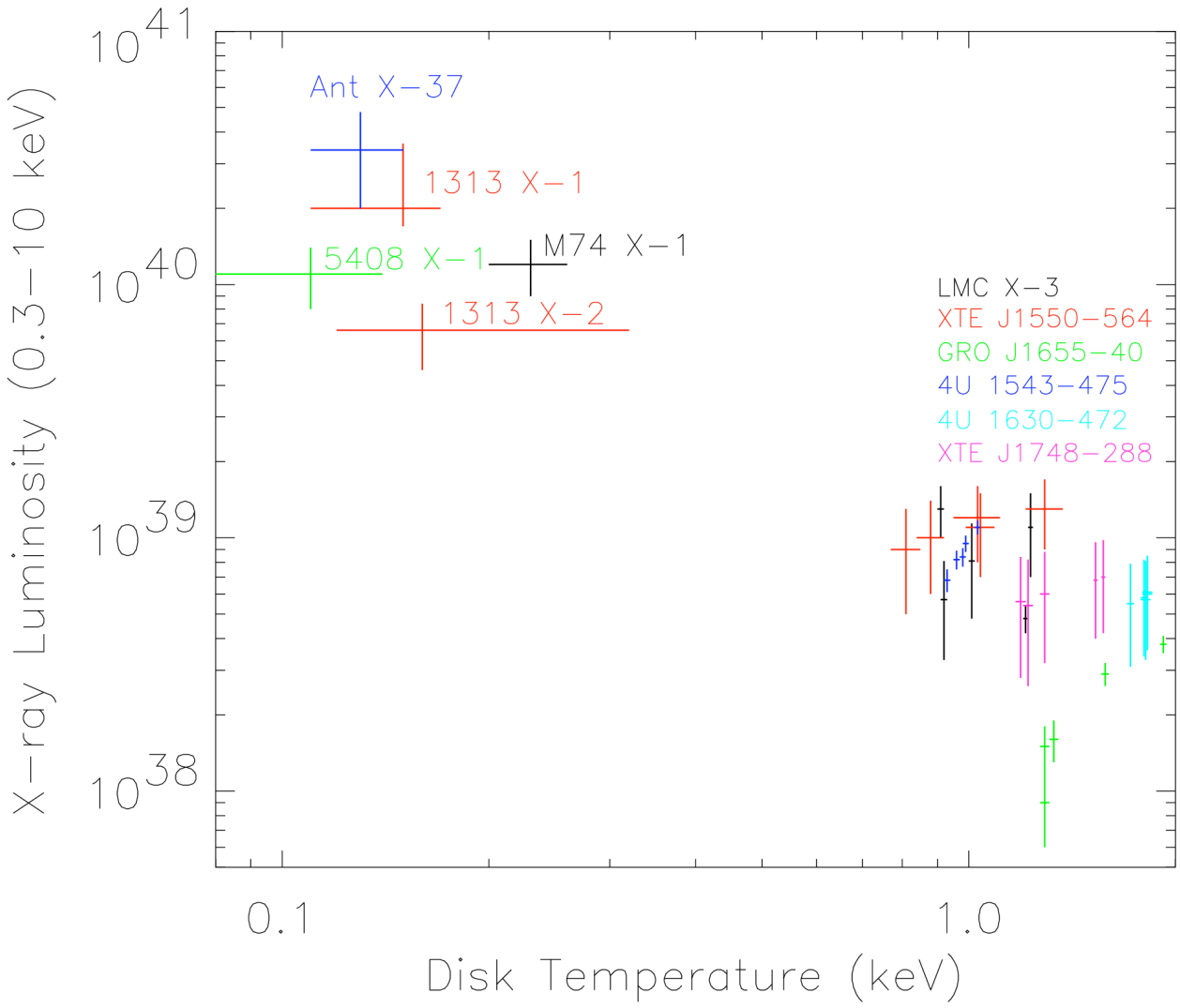
- The jet ejection mechanism can be constrained by probing the coronal geometry, corona-disk interaction.

- Multiple-component spectra in quiescent systems.

_ *We need to be able to handle 1 Crab sources, whether through calorimeter design, defocusing, or both.*

(won't someone please ask me about ULXs / IMBHs?)

Con-X: The Machine for ULXs



Con-X Will Reveal Reflection in ULXs

NGC 1313 X-1: L_X = 2 E+40
Disk Temp: 150 eV